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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,346	04/11/2006	Takamitsu Saito	NNA-115-B	3501
48980	7590	10/19/2010		
YOUNG BASILE				
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TROY, MI 48084				
EXAMINER				
HAILEY, PATRICIA L				
ART UNIT		PAPER NUMBER		
1732				
NOTIFICATION DATE		DELIVERY MODE		
10/19/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/575,346

Applicant(s)

SAITO ET AL.

Examiner

PATRICIA L. HAILEY

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2010.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 14-18 is/are pending in the application.
4a) Of the above claim(s) 11, 12 and 14 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-10 and 15-18 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on April 11, 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 08/02/2010
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

Applicants' remarks and amendments, filed on August 4, 2010, have been carefully considered. No claims have been canceled or added; claims 1-12 and 14-18 remain pending in this application.

Election/Restrictions

1. Claims 11, 12, and 14 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected electrode (claim 11) and to a nonelected battery/vehicle (claims 12 and 14), there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on February 15, 2010.

Claims 1-10 and 15-18 remain under consideration by the Examiner.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicants' Priority Documents were filed on April 11, 2006.

Maintained Rejections

The following rejections of record have been maintained; the text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. *Claims 1-3 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Scherson (WO 01/80338).*

Scherson teaches a method of fabricating a microbattery (as well as the formation of electrode/electrolyte/electrode assemblies, see page 6, lines 1-3), comprising the steps of depositing droplets of a first electrode material onto a substrate ("base material") using a microdispensing device (e.g., an ink-jet printer, "ink-jet device"), and depositing droplets of an electrolyte material onto said deposited electrode material. See claims 1 and 3 of Scherson.

Figure 4 of Scherson depicts the formation of a microbattery, wherein a substrate (formed by patterning metal layers onto smooth glass or silicon, "collector", **claim 3**) is provided, and an anode, an electrolyte comprised of a polymer solution ("binder material", **claim 1**), and a cathode are all applied via ink-jet printing using independent ink-jet heads. See page 7, lines 3-14 of Scherson.

Scherson further teaches that inks useful in fabricating microbatteries contain components such as lithiated transitional metal oxides and carbon, and also preferably comprise a dispersant such as an acrylic copolymer and a resin such as polyvinyl butyral, dissolved in an alcohol mixture. For materials for preparation of Li^+ electrodes, materials such as small particles of oxides, sulfides, or carbon as active materials, high area carbon as a conductivity enhancer, and a polymeric binder are employed. See page 7, lines 15-29 of Scherson. This disclosure is considered to read upon the

limitations “first electrode ink composition”, “second electrode ink composition”, “electroconductive material”, etc., as recited in **claims 1 and 2**.

Scherson does not explicitly disclose the formation of an “electrode catalyst layer”, as instantly claimed. However, because this reference teaches the formation of a microbattery via method steps comparable to that instantly claimed, and also discloses the employment of materials corresponding to Applicants’ claimed first and second electrode ink compositions, the skilled artisan would have found it obvious to form an electrode catalyst layer by performing the method of Scherson, absent the showing of convincing evidence to the contrary.

4. Claims 1-6, 8, 10, and 15-18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (U. S. Patent Application Publication No. 2005/0116375) in view of Scherson (WO 01/80338).

Regarding **claims 1, 2, 10, 15, and 17**, Ito teaches the formation of electrode materials comprising either (1) a rubber-based emulsion, activated carbon particles, conductive particles and a surfactant, or (2) a dispersion of PTFE, activated carbon particles conductive particles and a surfactant, wherein the solid content is 25% by weight or more, said electrodes produced by forming an electrode layer on a conductive substrate “by any method without limitation, such as application methods”, such as spraying. See paragraphs [0024]-[0026], [0093], and [0096] of Ito.

Regarding **claim 3**, Ito teaches: "Known materials useable as collectors in carbon electrodes, etc. are preferably used as conductive substrates." See paragraph [0094] of Ito.

Regarding **claims 4-6**, Ito teaches nonionic surfactants, such as sucrose fatty acid esters and polyoxyethylene alkyl ethers, as exemplary surfactants. See paragraph [0053] of Ito.

Regarding **claims 8 and 18**, Ito teaches that the content of surfactant in the electrode is not limited, but is generally about 0.1 to about 5% by weight, per 100% by weight of the electrode material. See paragraph [0056] of Ito.

Regarding **claim 16**, Ito teaches that the mean particle diameter of the conductive particulates can be appropriately determined without limitation within the range of 0.01 to 20 μm , see paragraph [0046] of Ito.

Although Ito teaches that the electrodes can produced by forming an electrode layer on a conductive substrate "by any method without limitation, such as application methods", Ito does not explicitly disclose the steps of ejecting droplets, as recited in **claim 1**.

Scherson teaches a method of fabricating a microbattery (as well as the formation of electrode/electrolyte/electrode assemblies, see page 6, lines 1-3), comprising the steps of depositing droplets of a first electrode material onto a substrate ("base material") using a microdispensing device (e.g., an ink-jet printer, "ink-jet device"), and depositing droplets of an electrolyte material onto said deposited electrode material. See claims 1 and 3 of Scherson.

It would have been obvious to the skilled artisan to modify the teachings of Ito by employing the method disclosed in Scherson, to effectively form the electrode layer on the conductive substrate, as Scherson teaches an exemplary "application method" encompassed by Ito.

5. Claim 7 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (U. S. Patent Application Publication No. 2005/0116375) in view of Scherson (WO 01/80338) as applied to claims 1 and 4 above, and further in view of Ito et al. (U. S. Patent No. 6,447,571).

Ito in view of Scherson is relied upon for their teachings with respect to claims 1 and 4. Although the combined teachings of these references, more particularly, Ito, teach the presence of a surfactant, Ito does not teach or suggest the HLB value of said surfactant.

Ito et al. is relied upon to show that nonionic surfactants such as polyoxyethylene mono- or dialkyl ethers and sucrose fatty acid esters (also disclosed in Ito, see paragraph [0053]) can have an HLB in the range of 3 to 20. See col. lines 15-28 and lines 38-52 of Ito et al.

Motivated by the teachings of Ito et al., the skilled artisan would have found it obvious to reasonably expect the nonionic surfactants of Ito to exhibit an HLB in the range of 3 to 20, given that both Ito et al. and Ito disclose the same nonionic surfactants.

6. Claim 9 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (U. S. Patent Application Publication No. 2005/0116375) in view of Scherson (WO 01/80338) as applied to claim 4 above, and further in view of Shimizu et al. (U. S. Patent No. 5,707,763).

Ito in view of Scherson is relied upon for their teachings with respect to claims 1 and 4. Although the combined teachings of these references read upon Applicants' claims regarding the "electrode active material" and "first electrode ink composition", neither reference teaches "at least one of a Li-Mn oxide compound and a Li-Ni oxide compound".

However, Scherson teaches that inks useful in fabricating microbatteries contain components such as lithiated transitional metal oxides. See page 7, lines 15-29 of Scherson.

Shimizu et al. is relied upon for its teachings that it is known in the art to employ materials such as lithium nickel oxide and lithium manganese oxide as positive electrode active materials in the formation of electrode compositions. See col. 6, lines 14-19 of Shimizu et al.

It would have been obvious to the skilled artisan to modify the teachings of Ito in view of Scherson by incorporating therein materials such as lithium nickel oxide and lithium manganese oxide, motivated by the teachings of Shimizu et al., as these materials fall within the phrase "lithiated transitional metal oxides", as disclosed by Scherson.

Response to Arguments

In response to Applicants' arguments traversing the rejections of record, the Examiner respectfully submits that although the prior art may not disclose "using two nozzles to apply two separate mixtures of components resulting in a single anode or cathode layer", Applicants' claims in their present form do not explicitly teach this limitation. Applicants' claims do not clearly reflect that the first and second electrode ink compositions, in combination, form "one of a positive and negative electrode layer".

Further, the claims do not reflect that the first and second electrode ink compositions are ejected simultaneously, or one immediately after the other. Because Applicants' claims recite the term "comprising", Applicants' claims are open to the deposition of other compositions between the first and second ejecting steps.

Moreover, in view of Applicants' claims, it appears that the first and second electrode ink compositions, although both present on the base material, are or can be on top of each other (i.e., layered).

Therefore, the application of the anode and cathode (each being "separate mixtures"), as taught by Scherson, and the formation of electrode materials, as taught by Ito, read upon Applicants' claims.

Ito et al. and Shimuzu et al. remain relied upon for its teachings regarding the HLB value of the nonionic surfactants disclosed in Ito, and regarding the employment of materials such as lithium nickel oxide and lithium manganese oxide as positive electrode active materials in the formation of electrode compositions, respectively.

For these reasons, Applicants' arguments have been considered, but are not persuasive.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **PATRICIA L. HAILEY** whose telephone number is (571)272-1369. The examiner can normally be reached on Mondays-Fridays, from 7:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin C. Mayes, can be reached on (571) 272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICIA L. HAILEY/
Primary Examiner, Art Unit 1732
October 13, 2010